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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

SAN JACINTO INSECT CONTROL PROJECT, SAN BERNARDINO NATIONAL FOREST

SEASON OF 1936-1937

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by
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Berkeley, California
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FOREST INSECT CONTROL MAP.
SAN JACINTO MOUNTAIN AREA.
SEASON OF 1937.

Privately owned trees treated under supervision of State Div. of Forestry.

Forest Insect Laboratory
Berkeley - California
April 9, 1937

SAN JACINTO INSECT CONTROL PROJECT, SAN BERNARDINO NATIONAL FOREST

SEASON OF 1936-1937

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SAN JACINTO INSECT CONTROL PROJECT
SAN BERNARDINO NATIONAL FOREST
SEASON OF 1936-37

INTRODUCTION

During the season of 1936 insect conditions on the San Jacinto District, San Bernardino National Forest, were found to be disturbingly high for the pine stands of this area. Due to the accumulated losses of the previous season the area assumed the appearance of one approaching and early epidemic. This condition was reported by Mr. J. E. Patterson (1) as early as July, 1936.

During the latter part of November, 1936, Mr. J. M. Miller, Senior Entomologist of the U. S. Bureau of Entomology and Plant Quarantine, Berkeley, California, in company with Mr. Ed Neilander and Mr. Charles Van Fleet, State Rangers, State Department of Natural Resources, Division of Forestry, covered the Idyllwild area and considered the infestation to be at a low point of the cycle. It was estimated at that time that probably less than 50 trees would be found and marked for treatment on the area in and around Idyllwild.

Since the infestation was found to be of an endemic nature and supposedly at a low point in the cycle, a control project to thoroughly clean up the area before losses could increase was undertaken.

Cooperative Arrangements:

Land ownership in and around the Idyllwild basin is divided somewhat evenly between government and private holdings. The majority of the land on the valley floor is in the hands of private concerns while the more outlying territory is governmental.

Since this condition exists it was deemed necessary to make a cooperative arrangement with the State Division of Forestry to furnish personnel equal to that furnished by the U. S. Forest Service to carry out the proposed control project.

With the above arrangements being agreed upon the State Division of Forestry was represented by Mr. Charles Van Fleet, and the U. S. Forest Service represented by the writer. Mr. Ed Neilander was in general charge of the project and with the cooperative arrangements agreed upon, actual work was begun December 1, 1936.

Insects Involved in the Infestation:

There are primarily three species of insects entering into the infestation on the San Jacinto District; namely, the western pine beetle, (Dendroctonus brevicomis Lec.) Figure 1; flathead wood borers, (Melanophila sp.) Figure 2; and engraver beetles of the genus Ips, (Ips confusus) Figure 3. The flathead borers (Melanophila sp.) are by far the most destructive insects

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(1) Patterson, J. E. August 4, 1936. Report of Forest Insect Conditions in the Southern National Forests of the California District, June 1936.

on the area, especially in the fringe timber south of Idyllwild. The western pine beetle has taken a few groups of Coulter pine while Ips confusus has confined its attacks to pole-sized trees or works in conjunction with the western pine beetle in the upper portion of the infested trees.

The Jeffrey pine beetle, Dendroctonus jeffreyi, was not noted on the entire area covered even though Jeffrey pine grows here in abundance.

Fall Survey:

Due to the general topographic features of the area around Idyllwild, the heavy under cover present, and the sparseness of infested trees, the topographic method of "spotting" was employed. From the many points of advantage the surrounding hillsides and bottomlands could be seen, thus enabling faded trees to be tentatively located. After this preliminary location of possible infested trees, each was visited for examination. If the tree was found infested, a number was placed on a north side blaze and duplicate Bureau of Entomology tree tags made out. One tag was left on the tree while the other was retained to be used for location and ownership data. If the tree was found abandoned, i.e., if the brood causing the death of the tree had matured and left, a tally was made consisting of DBH, height, and year of kill. In this way a check could be made as to whether the infestation was active and spreading or lower than the previous year.

The original plan of the project was to make an intensive survey of the area in and around Idyllwild. After this was done it was considered advisable to extend the survey to adjacent areas as insect conditions were found to be heavier in the fringe timber to the south. The boundaries of this extended survey was to take in enough country to form natural barriers and prevent the area under control from becoming re-infested from nearby untreated areas.

Spotting was continued to the south of Idyllwild and all infested trees marked for treatment. In this way the boundary on the south and west consisted of the timber edge, while on the north and east topographic features presented a good protection from insects moving in from the outside.

Upon the request of Mr. Ed Heilander, other more isolated areas on the district were looked over with the following conditions prevailing:

(1) Santa Rosa Mt.

Santa Rosa Mt. and the adjoining timber inside the National Forest boundary was found to be practically free from insect depredations. When this area was covered only six infested trees were found. These trees, all Jeffrey pine, were infested with flathead wood borers (Melanophila sp.) and were located on the very fringe of the timber. A total of 2,850 BM constituted the 1936 winter infestation and previous losses were negligible.

(2) Thomas Mt.

As previously reported, the infestation on Thomas Mt. consisted mainly of topkilling. A few trees, near the timber boundary were found

killed and infested by flathead borers. Due to the isolated nature of the mountain and the sparseness of infested trees, it was not considered advisable to carry control operations into this area.

(3) Tahquitz Valley:

Due to the fact that Tahquitz Valley lies in the heart of the San Jacinto Primative area and is included in the State Park it was considered advisable to make a reconnaissance of this area. Only two large Jeffrey pines were found infested in the Valley. Flathead borers were here again responsible for the death of these trees. No evidence or indications of previous loss or conditions favoring future losses were noted. Since the timber here consists largely of overmature trees a check on insect conditions should be made periodically, in order that preparations may be made to prevent any flareup of conditions that might threaten this heavily used recreational area.

(4) Round Valley:

This valley, in the near vicinity to Tahquitz Valley, is also included in the Primitive Area and State Park. Conditions were found to be similar to those in Tahquitz Valley and no infestation was found, nor was indication of past losses.

Composition of Infestation:

During the time that control operations were underway a complete examination of the bole of 33 trees was made. This was done to secure a more complete picture of the insect involved in the death of the tree, as only the basal six or eight feet can be examined when the initial cruise is made.

It was found that in Jeffrey pine, flathead borers were responsible for the death of the tree in all cases. The infestation was quite solid for the entire length of the bole and the brood very heavy. In the majority of cases the brood was found in the prepupal stage in pupal cells in the outer bark. These figures represent the findings from 21 trees and it is believed that a representative sample of the area has been secured.

Ponderosa pine was found likewise to be primarily infested with flathead borers, but as the trees representing the sample are smaller this condition does not necessarily represent the conditions over the entire area

Coulter pine on the area is infested primarily with the western pine beetle, with flathead borers and/or the engraver beetle, Ips confusus, working in conjunction. The grouping of Coulter pine killed during the 1935 season was the result of primary attacks by the western pine beetle.

Trees in which only the top had been killed were not marked for treatment. In this area, each tree has considerable value, and any chance of survival is worth taking, though, of course such trees become "spike tops". A half of a tree is considered better than no tree at all.

(1) Flathead Borers (Melanophila sp.):

From the total of 182 trees marked for treatment, 60% were killed by flatheads. This kill represents 38,720 B.M. or 59% of the total volume concerned. These insects do not take trees in large groups, but seem to confine their attacks to single trees in the poorer timber on the more exposed sites.

(2) The Western Pine Beetle:

The western pine beetle appears to have diminished in importance on this area since control operations on the district in 1931. Only 23 trees marked for treatment were classed as killed by this species.

(3) Other Insects:

The loss to sugar pine on the area has been the result of attacks by the mountain pine beetle (Dendroctonus monticolae Hopk.) Only one tree containing brood was found but previous losses indicate that this species can threaten the sugar pine on the area.

Ips confusus, found attacking poles in small groups, is undoubtedly responsible in part for the topkilling on the area.

Acres Covered by Survey:

The intensive survey and marking of infested trees was concentrated in portions of six townships. Either the entire portion or parts thereof of the following sections were included in the survey:

T.4S., R2E., S.36
T.4S., R3E., S.31,32
T.5S., R2E., S.1, 2, 11, 12, 13, 14, 24, 25, 36
T.5S., R3E., S. 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31, 32
T6S., R.2E., S.1, 2
T.6S., R3E., S.5, 6, 7, 8

The portions of the above townships covered represent a total of 13,285 Acres. In this area 182 trees were marked for treatment. Sixty-eight trees were Jeffrey pine., 44 Coulter pine, and 70 ponderosa pine. Of this number 42% were located on government land, the remainder being on private holdings.

The 1936 winter loss of 182 trees represented a volume of 65,720 B.M. Of this total 25,010 B.M. was Jeffrey pine, 10,000 B.M. Coulter pine, and 29,710 B.M. ponderosa pine. Infested trees on Government land constituted 54% of the total volume or 35,480 B.M. An addition of 36 poles, ranging in diameters of 4"-10", located in close proximity to marked trees, were blazed for cutting and treatment.

Previous Losses:

As mentioned above, a tally was made of insect-killed trees of previous seasons, namely 1935 summer and winter, and 1936 summer. In this way the intensity of the current loss and the trend of the infestation could be determined. Due to the difficulty of accurately determining the season of kill during 1935, these trees are grouped and will be referred to as killed during the season 1f 1935. The 1936 losses are segregated into summer and winter broods. It will be noticed from the following table (Table I) that insect conditions in the San Jacinto District are of an endemic nature. Small fluctuations in number of trees killed occur from year to year but epidemic proportions have not been reached.

TABLE I

Year of Attack	No. of Trees	B.M. Volume	Average B.M. Vol. per tree	Aver. No. of trees per acre
1935	169	72,400	233.4	.13
1936-S	121	47,750	253.4	.09
1936-W	182	65,720	276.9	.14

Arrangements for Control Operations:

Due to the heavy snows during the month of January, control operations were suspended until March 1, 1937. At this time the numerous roads throughout the area were again accessible.

Since insect control was definitely a part of the proposed program for the Kenworth CCC Camp Co. 2925 P 144, CCC labor was used throughout control operations. A crew of from 14 to 18 men, including two assistant leaders, was utilized for a period of three weeks, the time necessary to treat infested trees on government land.

Arrangements for deposition of trees on private land is still under way with supervision by Mr. Ed Neilander. The outcome of these arrangements will probably result in a release of infested trees by private parties to people interested in securing these trees for wood. An account of the treating of these trees should be secured from the State Division of Forestry when the project is completed.

Trees Treated:

Due to road conditions resulting from the heavy storms, all infested trees on government land were not treated. A few small trees in very inaccessible areas were left untreated. In the accompanying map., all trees underlined, numbers of which appear on the map, are located on government land and have been treated. The remaining trees are mostly on private holdings and are now being treated under charge of Mr. Charles Van Fleet.

Methods Used:

(1) Pit burning:

After taking into consideration the fire hazard present on the area

at any time of the year, and the fact that this recreational area is used quite heavily during the summer months, it was decided that pit burning should be employed whenever possible. This method consists of felling the tree, peeling the bark, and hauling bark and limbs to an open place for burning. In this way, the fire hazard is greatly reduced and the treated log not left as a mass of blackened wood and ashes to be seen by the private land owners.

(2) Regular Treatment:

There were several cases where the pit burning method was not adaptable. When infested trees could not be felled so as the under side of the log could not be peeled, the regular method of chucking the bark, taken from the upper half of the log all along the bole and setting fire to the whole tree was used. This method was used where the trees were out of sight and inaccessible for wood, or when the tree was too large to handle the peeling of the under side.

Summary:

Due to the increased use of the recreational area in the San Jacinto District a thorough cleaning of the insect infestation was undertaken.

Since the land ownership in the area under treatment is quite evenly divided between private and government holdings, a cooperative arrangement between State and Federal government was devised.

Three species of insects were found to be primarily involved in the infestation, namely; (1) flathead borers (Melanophila sp.); (2) the western pine beetle (Dendroctonus brevicomis) and (3) the engraver beetle (Ips confusus).

The fally survey, consisting of a systematic coverage of the area was begun December 1, 1936 and completed December 24, 1936.

Insect conditions in outlying areas in the District were found to be negligible.

A total of 13,285 acres was covered by the survey, marking 182 trees, representing 65,720 B.M. for treatment.

Previous losses, especially the 1935 infestation were found to be no greater than the loss incurred during 1936.

Control operations were completed by use of CCC labor. 83 trees were treated in three weeks time, representing a total volume of 32,470 B.M. using from 14-18 men per day.

Pit burning was used to treat infested trees in all cases where log could be used for wood or could be seen by private land owners.

Figure 1

Characteristic work of the western pine beetle (Dendroctonus brevicomis Lec.).

Figure 2

Characteristic work of flathead borers (*Melanophila* sp.)

Figure 3

Characteristic work of the engraver beetle (Ips confusus)/

Figure 4

36" Jeffrey pine infested by flatheads, cut and treated by Kenworthy CCC camp in March, 1937. Tree felled and ready for limbing.

Figure 5

Same tree as in Figure 4; peeled and burning.

Numbers of Government trees treated

16
21
22
23
24
25
31
32
35
37
39
43
44
45
46
47
48
49
50
66
117
118
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142
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144
145
146
147
149
150
150a
151
151a
152
153
153a
153b
154
154a
155
156
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158
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163
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186
187
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189
190
191
192
193
194
194a
196
197
198
199
200

R.2E. R.3E. T.4S.

T.5S.

T.6S.

LILY ROCK

TAHQUITZ PK.

CAMP EMERSON

IDYLLWILD R.S.

STRAWBERRY VALLEY

CAMP JAMISON

KEEN CAMP G.S.

KEEN CAMP P.O.

HURKEY CR. CAMP

HEMET RESVR.

LEGEND

· = PONDEROSA PINE

Δ = JEFFREY PINE

° = COULTER PINE

Numbers indicate infested trees marked for treatment during survey. December 1-24, 1936.

Underlined numbers indicate trees on government land treated during control operations, March 1-20, 1937.

SAN JACINTO DISTRICT

SAN BERNARDINO N.F.

CALIFORNIA

INSECT CONTROL 1936-37